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S8432PUS

**Claims**

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1. An optical monitoring apparatus comprising  
a light transmitter (10; 36) for the transmission of at least two light  
beams (40, 42) offset substantially parallel to one another into a  
protected zone; and  
10 a light receiver (14; 36) for the reception of the transmitted light  
beams (40, 42) and for the outputting of corresponding received sig-  
nals,  
wherein the light receiver (14; 36) has at least one photo-sensitive  
element (32) having an elongate light sensitive region (54) whose  
15 longitudinal direction is aligned parallel to the arrangement of the  
light beams (40, 42) perpendicular to the direction of transmission  
such that all radiated light beams (40, 42) can be completely de-  
tected by the light sensitive region (54); and  
wherein a control circuit (34) is provided for the distinguishing of  
20 the light beams (40, 42) at the light receiver (14; 36) and causes the  
light transmitter (10; 36) to make a transmission of the light beams  
(40, 42) offset in time.
2. An apparatus in accordance with claim 1, characterized in that the  
25 light transmitter (10; 36) has a light source (16) and a diaphragm  
arrangement (20) by which a respective light beam (40, 42) to be  
transmitted can be selected from the light of the light source (16).

3. An apparatus in accordance with claim 2, characterized in that the diaphragm arrangement (20) has an electronically controllable intensity filter.
- 5 4. An apparatus in accordance with claim 2, characterized in that the diaphragm arrangement (20) has an LCD shutter.
5. An apparatus in accordance with claim 1, characterized in that the light beams (40, 42) adjoin one another or overlap one another at  
10 least regionally.
6. An apparatus in accordance with claim 1, characterized in that the light beams (40, 42) are spaced apart from one another.
- 15 7. An apparatus in accordance with claim 1, characterized in that the extent of the light sensitive region (54) is more than twice the size in the longitudinal direction of the light sensitive region (54) than the extent of the light beams (40, 42) at the location of the light receiver (14; 36); and in that the extent of the light sensitive region (54) per-  
20 pendicular hereto substantially corresponds to the extent of the light beams (40, 42).
8. An apparatus in accordance with claim 1, characterized in that the light receiver (14; 36) has a plurality of photo-sensitive elements (32)  
25 which are arranged in a row next to one another with a parallel alignment of the light sensitive regions (54).
9. An apparatus in accordance with claim 8 characterized in that the arrangement of the plurality of photo-sensitive elements (32) ex-  
30 tends within the plane perpendicular to the transmission direction

of the light beams (40, 42) perpendicular to the offset arrangement of the light beams (40, 42).

- 5 10. An apparatus in accordance with claim 1, characterized in that the light receiver (14; 36) has a CMOS row.
- 10 11. An apparatus in accordance with claim 1, characterized in that the light transmitter (10; 36) and the light receiver (14; 36) are arranged at the same side of the protected zone and the transmitted light beams (40, 42) can be deflected in the direction of the light receiver (14; 36) by at least one reflector (12) arranged at the respectively opposite side of the protected zone.
- 15 12. An apparatus in accordance with claim 11, characterized in that a separate reflector (12) is associated with each light beam (40; 42)
- 20 13. An apparatus in accordance with claim 11, characterized in that at least one reflector (12), and in particular every reflector (12), has an encoding perpendicular to the offset arrangement of the light beams (40, 42).
- 25 14. An apparatus in accordance with claim 1, characterized in that the light receiver (36) is integrated into the light transmitter (36).
15. An apparatus in accordance with claim 1, characterized in that the light receiver (14) is arranged spaced apart from the light transmitter (10).

16. An apparatus in accordance with claim 1, characterized in that the apparatus is provided for attachment to an upper tool (48) of a bending press.
- 5 17. An apparatus in accordance with claim 16, characterized in that the light beams (40, 42) are arranged beneath one another beneath the bending line (50) of the upper tool (48).

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